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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/831,240	05/03/2001	Mark Dunn	R&G C-323	1405

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EXAMINER

NGUYEN, KIMBINH T

ART UNIT	PAPER NUMBER
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2671

DATE MAILED: 02/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/831,240

Applicant(s)

DUNN, MARK

Examiner

Kimbhinh T. Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 October 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 9-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 9-22 is/are rejected.
- 7) ☒ Claim(s) 13 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

1. This action is responsive to amendment filed 10/20/03.
2. Claims 9-22 are pending in the application.
3. The drawings were received on 10/20/03. These drawings are figures 1 and 2.

Claim Objections

4. Claim 13 is objected to because of the following informalities: typing errors: line 17, delete "at the". Appropriate correction is required.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 9-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Duluk, Jr. et al. (6,476,807).

Claim 9, Duluk, Jr. et al. teaches defining a set of surfaces that represent object in the image (col. 2, lines 62-66; fig. 1). Duluk, Jr. does not teach generating a depth value as a function of the distance of the object surfaces from an image plane; however, Duluk, Jr. et al. teaches z coordinate values in a scaled version of distance from the viewing point (distant geometry; col. 2, lines 46-60; fig. 1; col. 3, lines 49-55); this

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feature corresponds to generating a depth value for the object surfaces that may be visible (the surfaces closest to the scene) at the elementary area as a function of the distance of the object surfaces from an image plane, because many different portions of geometry can effect the same pixel, the geometry representing the surfaces closest to the scene viewing point must be determined. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize generating the z coordinate value taught by Duluk, Jr. et al. for determining the visible surfaces within the volume, because non-opaque surfaces (may be visible) closer to the viewing point (the function of the distance), it would eliminate hidden portions of geometry in a pipeline before they are rasterized (col. 3, lines 40-44); Duluk, Jr. also teaches determining translucency values (alpha values) for texture data to determine opaque object surfaces or transparency (col. 48, lines 25-41); for an opaque object, storing the depth value (zfar and znear); comparing the depth value (col. 49, lines 1-29); determining the opaque object surface is closer to the image plane, replacing the stored depth value (col. 49, lines 23-26).

Claim 10, Duluk, Jr. et al. discloses replacing the stored depth value (col. 49, lines 23-26).

Claim 11, Duluk, Jr. et al. discloses the image is divided into rectangular areas (tiles, stamps, samples); replacing the stored depth value are performed on a rectangular area by rectangular area basis (each sample has its own color values and z value; col. 20, lines 46-56).

Claim 12, Duluk, Jr. et al. discloses after comparing the depth value, if the object surface is behind the opaque object surface for a depth value is stored (an opaque sample in front of the sample subject to alpha test; col. 32, lines 22-23), the surface defining data is discarded (the sample subject to alpha test is not kept; col. 32, lines 14-15); the object surfaces are sorted back to front (sorted transparency mode) relative to the image plane wherein the first surface is the opaque object surface (col. 32, lines 61-65); shading and texturing (performing hidden surface removal) based on the data for non-opaque object surfaces (transparent object surfaces) forward of the opaque object surface send the backmost transparent surface down the pipeline; col. 33, lines 15-41).

Claims 13 Duluk, Jr. teaches method and apparatus for performing hidden surface removal in a graphic processor (abstract) comprising claim elements same as claim 9; therefore, the rationale provided in the rejection of claims 9, is incorporated herein.

Claim 14, Duluk, Jr. et al. discloses surface shading and texturing the object surface (alpha test); col. 9, lines 24-43).

Claim 15, Duluk, Jr. discloses discarding the surface data (alpha test; col. 9, lines 30-37); sorting the object surfaces back to front (see the rejection of claim 12).

Claim 16, the rationale provided in the rejection of claim 9 is incorporated herein. In addition, Duluk, Jr. et al. teaches sorting the object surfaces in front to back and discarding the surface defining data behind the opaque object surface (invisible transparent layers; col. 33, line 42 through col. 34, line 24).

Claim 17, Duluk, Jr. et al. teaches sorting back to front and performing shading and texturing the image based on transparent surface data (see the rejection of claim 12).

Claim 18, Duluk, Jr. et al. teaches based on the texture defining data, determining whether or not, the surface is completely opaque (alpha value of zero indicates that a vertex is opaque; col. 48, lines 36-37); an object surface is completely opaque is not performed (turn off blending; col. 48, lines 39-41).

Claim 19, Duluk, Jr. et al. teaches the image is divided into rectangular areas (or tiles, stamps, samples; col. 20, lines 46-56); sorting the object surfaces front to back and determining whether or not an object surface is completely opaque (alpha value is one) are performed on a rectangular area (or sample; col. 49, lines 36-63).

Claims 20, the rationale provided in the rejection of claim 13 is incorporated herein. In addition, Duluk, Jr. teaches sorting front to back (see the rejection of claim 16).

Claim 21, Duluk, Jr. et al. teaches sorting back to front (see the rejection of claim 15).

Claim 22, the rationale provided in the rejection of claim 18 is incorporated herein.

Response to Arguments

7. Applicant's arguments filed 10/20/03 have been fully considered but they are not persuasive, because Duluk, Jr. et al. teaches a method and system of image rendering wherein hidden surface removal is performed in the pipeline (col. 22, lines 66-67), the

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method comprising: performing depth test (col. 21, line 65 through col. 22, line 13), alpha test to determine opaque object surfaces (col. 48, lines 25-41), sorting the object surfaces back to front or front to back (col. 48, line 43 through col. 49, line 53); depth testing (zfar, znear) is performed on the opaque surfaces to determined which one of the opaque layer closest to the image plane (col. 32, line 55 through col. 33, line 67). Duluk, Jr. also teaches determining translucency values (alpha values) for texture data to determine opaque object surfaces or transparency (col. 48, lines 25-41); for an opaque object, storing the depth value (zfar and znear); comparing the depth value (col. 49, lines 1-29); determining the opaque object surface is closer to the image plane, replacing the stored depth value (col. 49, lines 23-26). Therefore, Duluk, Jr. et al. reference renders the limitations of claims 9-22 obvious.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Kimbinh Nguyen** whose telephone number is **(703) 305-9683**. The examiner can normally be reached **(Monday- Thursday from 7:00 AM to 4:30 PM and alternate Fridays from 7:00 AM to 3:30 PM)**.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Zimmerman, can be reached at (703) 305-9798.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

Or faxed to:

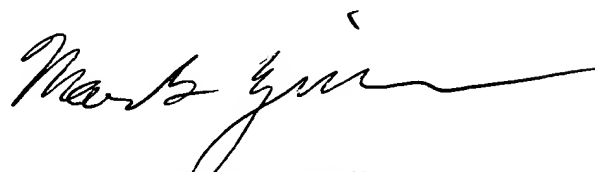
(703) 872-9314 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Part II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

Kimbinh Nguyen

February 17, 2004



MARK ZIMMERMAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600